

Atty. Dkt. No. 039153-0484 (G1190)

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of using an adhesion precursor layer in an integrated circuit fabrication process, the method comprising:
providing ~~a first gas~~ an adhesion layer over a dielectric material ~~to form an adhesion precursor layer~~, the dielectric material including an aperture, the ~~first gas~~ adhesion layer including a ternary element of Iridium, Ruthenium, or Rhenium;
providing a blending layer comprised of an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr; and
~~providing a second gas including an alloying agent over the adhesion precursor layer to provide a copper layer over the adhesion precursor layer~~ blending layer, the copper layer including Zr, Ca, Al, La, or Hf.
2. (Currently Amended) The method of claim 1, wherein the adhesion ~~precursor~~ layer includes a barrier material.
3. (Original) The method of claim 1, wherein the adhesion precursor layer has a thickness of 10-100 Angstroms.
4. (Currently Amended) The method of claim 1, further comprising providing a ~~second gas of a second material~~ three gasses to form the blending layer over the adhesion precursor layer.
5. (Currently Amended) A method of using an adhesion precursor in an integrated circuit fabrication process, the method comprising:
providing ~~a first gas~~ an adhesion layer over a dielectric material ~~to form an adhesion precursor layer~~, the dielectric material including an aperture; and

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providing a blending layer comprised of an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr; providing a second gas of a second material over the adhesion precursor layer; and

providing a copper layer over the blending adhesion precursor layer, wherein the copper layer is provided using a second gas including includes tin (Sn), indium (In), zinc (Zn), or chromium (Cr.), wherein the adhesion layer is provided using a first gas including includes a ternary element of at least one of Iridium, Ruthenium, or Rhenium.

6. (Currently Amended) The method of claim 4, wherein further comprising providing a third gas is utilized for the blending layer of a third material over a layer formed by the second gas.

7. (Currently Amended) A method of using an adhesion precursor in an integrated circuit fabrication process, the method comprising:

providing a gas of a first material over a dielectric material to form an adhesion precursor layer, the dielectric material including an aperture, the first material including a ternary element of Iridium, Ruthenium, or Rhenium; and

providing a second gas of a second material over the adhesion precursor layer; providing a third gas over a third material over a layer formed by the second gas; providing a blending layer comprised of an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr; and

providing a copper layer over the blending adhesion precursor layer, wherein the third using gas includes including an alloying element.

8. (Currently Amended) The method of claim 9, further comprising providing a gas including an alloying agent over the adhesion precursor layer when providing the blending layer.

9. (Currently Amended) A method of using an adhesion precursor in an integrated circuit fabrication process, the method comprising:

providing a gas of a first material over a dielectric material to form an adhesion precursor layer, the dielectric material including an aperture;

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providing a blending layer comprised of an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr; and

providing a copper layer over the ~~adhesion precursor~~ blending layer, wherein the ~~adhesion precursor~~ layer includes a ternary element of Iridium, Ruthenium, or Rhenium.

10. (Currently Amended) A method of improving adhesion between a copper layer and a dielectric layer by providing an adhesion precursor, the method comprising:

forming a trench in a dielectric layer;

providing an adhesion precursor gas above the dielectric layer and the trench to form an adhesion precursor layer, wherein the adhesion precursor layer includes a ternary element of Iridium, Ruthenium, or Rhenium and a blending layer comprised of an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr;

~~providing an alloy layer above the adhesion precursor layer; and~~

providing a copper layer above the alloy blending layer.

11. (Original) The method of claim 10, wherein the adhesion precursor layer has a thickness of 10-100 Angstroms.

12. (Currently Amended) The method of claim 10, ~~further comprising providing a blending layer over the adhesion precursor layer,~~ wherein the blending layer includes an alloying material.

13. (Previously Presented) The method of claim 10, wherein the adhesion precursor layer includes a material being selected from a group consisting of tantalum nitride, tungsten nitride, or disilicon nitride.

14. (Currently Amended) The method of claim 10, wherein the ~~alloy~~ blending layer has a thickness of up to ~~50~~ 250 Angstroms.

15. (Currently Amended) A method of using an adhesion precursor for chemical vapor deposition, the method comprising:

forming a trench in a dielectric layer;

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forming a continuous barrier adhesion precursor layer above the dielectric layer and along sides of the trench, the continuous barrier adhesion precursor layer including an adhesion layer and a blending layer, the blending layer includes an initial metal material, a copper containing material, and an alloying element of Sn, In, Zn, or Cr;

depositing copper above the continuous barrier layer, the copper located in the trench forming an integrated circuit feature, wherein the ~~continuous barrier~~ adhesion precursor layer includes a ternary material selected from a group consisting of Iridium (Ir), Ruthenium (Ru) and Rhenium (Re).

16. (Previously Presented) The method of claim 15, wherein the continuous barrier adhesion precursor layer includes Rhenium.

17. (Original) The method of claim 15, further comprising providing a chemical mechanical polish to level the copper to substantially the same level as the continuous barrier layer above the dielectric layer.

18. (Original) The method of claim 15, wherein the continuous barrier layer has a cross-sectional thickness of 10-100 Angstroms.

19. (Original) The method of claim 15, wherein the feature is a via.

20. (Previously Presented) The method of claim 15, wherein the continuous barrier adhesion precursor layer includes tantalum nitride, tungsten nitride, or disilicon nitride.